JCIA Annual Report 2017

Reference Materials

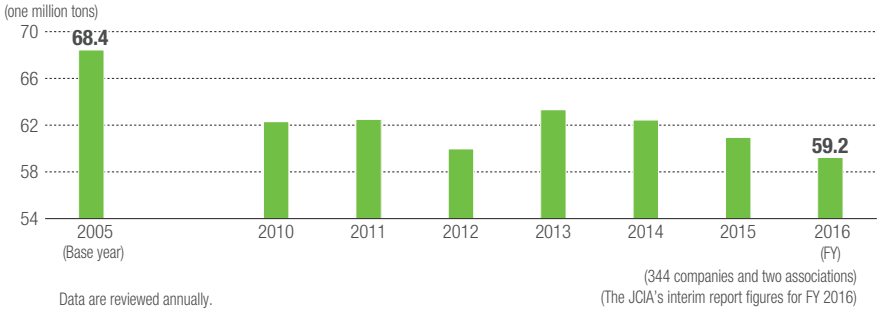
As a supplement to the contents of JCIA Annual Report 2017, this pamphlet introduces various data and initiatives relating to the activities of the Japan Chemical Industry Association. Please read it together with JCIA Annual Report 2017.

Japan Chemical Industry Association

Contents

1-1 Environmental Protection (Prevention of Global Warming)

CO_2 Emissions Index



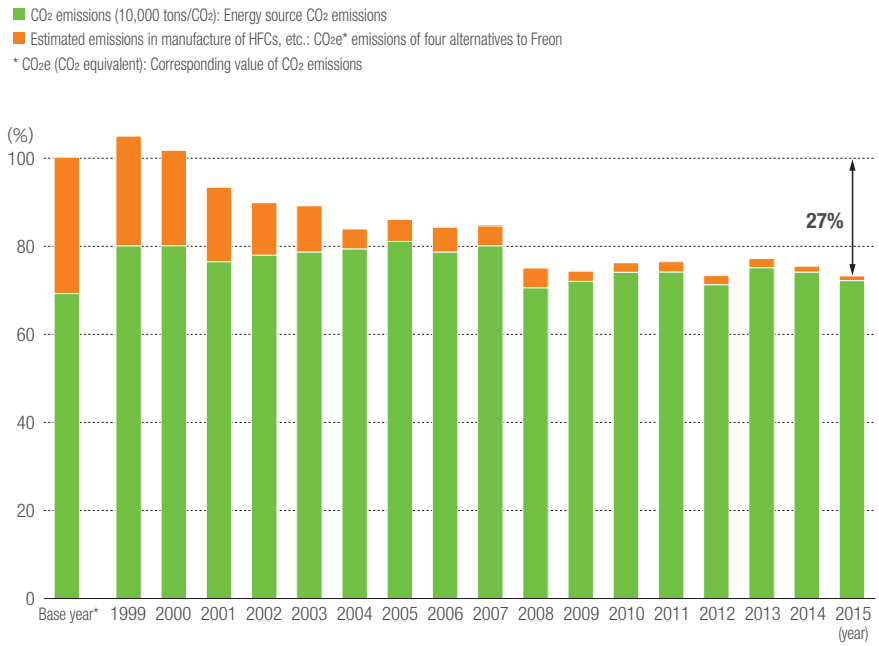
Data are reviewed annually.

(344 companies and two associations)
(The JCIA's interim report figures for FY 2016)

CO_2 Emissions Index

Emissions have reduced each year since the "Commitment to a Low-carbon Society" activities was started in FY 2013. In the last FY, CO_2 emission has been reduced by 9,200,000 tons (13.5%) compared to FY 2005 taken as the base year.

Reduction of Emissions of CO_2 and Four Alternatives to Freon



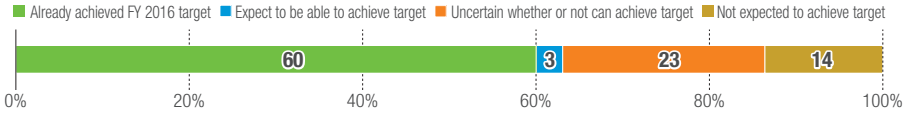
* Base years: The base year for CO_2 emissions is FY 1990; the base year for estimated emissions associated with manufacturing of HFCs, etc. is 1995 (calendar year).

Reduction of Emissions of CO_2 and Four Alternatives to Freon

When the reduction of CO_2 emissions and the reduction of emissions in the manufacture of four alternatives to Freon(HFCs, PFCs, SF_6, NF_3) are combined, emissions in 2016 were down 27% from the base years (= 100%).

1-2 Environmental Protection (Industrial Waste Reduction)

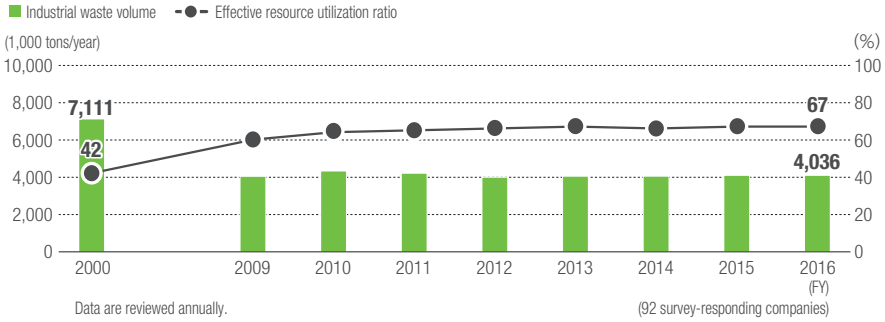
Progress in Achievement of FY 2016 Target for Final Disposal Volume



Progress in Achievement of FY 2016 Target for Final Disposal Volume

In accordance with the Keidanren (Japan Business Federation) Voluntary Action Plan on the Environment, JCIA set a target in FY 2011 (a reduction in final disposal volume by about 65% from the FY 2000 level by FY 2015) and has been working to achieve that goal.

Industrial Waste Volume and Effective Resource Utilization Ratio

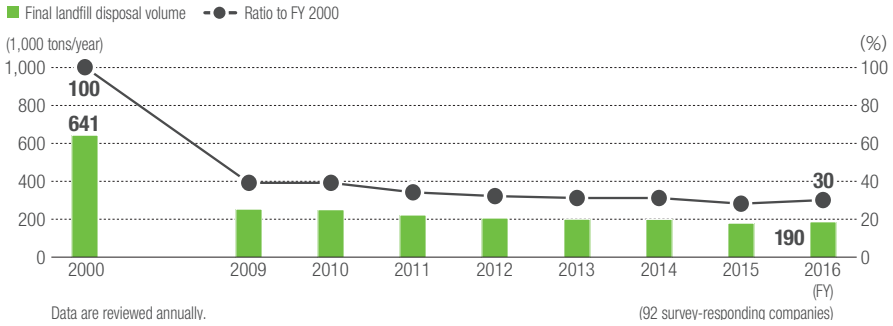


Data are reviewed annually. (92 survey-responding companies)

Industrial Waste Volume and Effective Resource Utilization Ratio

Industrial waste volume in FY 2016 was 4,036,000 tons, down 43% from the level in the base year of FY 2000. We are also making positive efforts to encourage sorting and reuse. The effective resource utilization ratio (the ratio to the volume of waste discharged by effectively used resources) increased from 42% in FY 2000 to 67% in FY 2016.

Final Landfill Disposal Volume



Data are reviewed annually. (92 survey-responding companies)

	Result of FY 2016	
	Relative to FY 2000	Relative to FY 2015
Industrial waste volume	Reduced by 43%	No change
Effective resource utilization ratio	Improved by 25 points	No change
Final disposal by JCIA members	Reduced by 70%	Increased by 7%

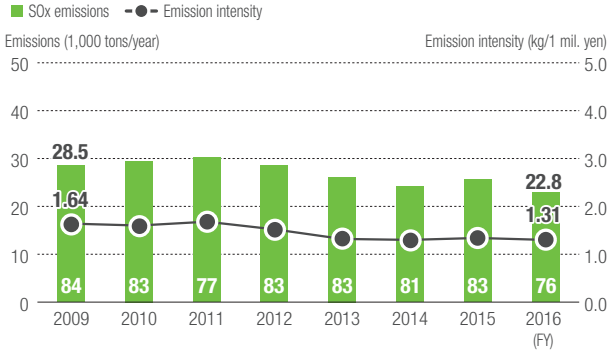
Final Landfill Disposal Volume

The final landfill disposal volume in FY 2016 was 190,000 tons, down 70% from the FY 2000 level. Furthermore, as well as reducing the final landfill disposal volume, in accordance with legal revisions member companies are strengthening their verification of the proper disposal of waste by, among other things, the issuance, recovery, and verification of industrial waste manifestos and the inspection of final disposal sites.

1-3 Environmental Protection (Prevention of Atmospheric Pollution and Water Pollution)

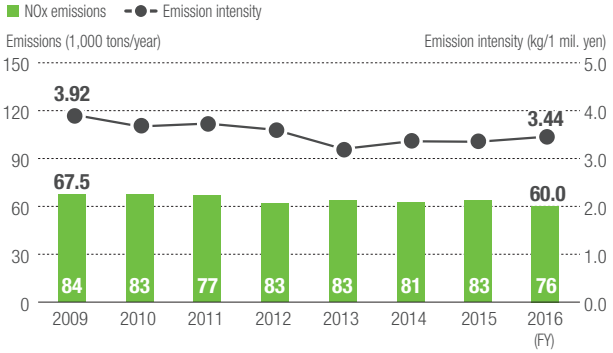
Chemical industrial companies in Japan have significantly reduced emissions of air and water pollutants. In particular, member companies not only comply with regulatory standards but also agreements with municipalities. They also set their own voluntary management criteria, which are more rigorous than government standards, to intensify their ongoing efforts to reduce emissions.

SOx Emissions



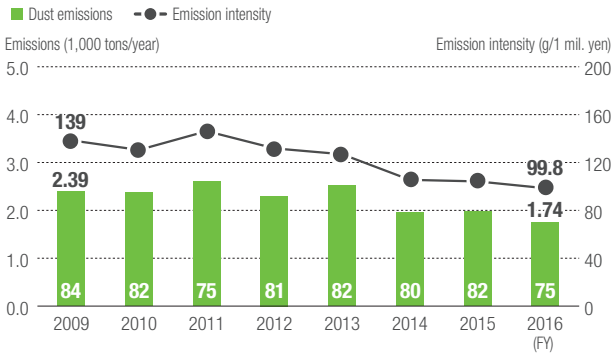
The figures in the bars indicate the numbers of companies that submitted data.
Emission intensity: Emissions per ¥1 million sales

NOx Emissions



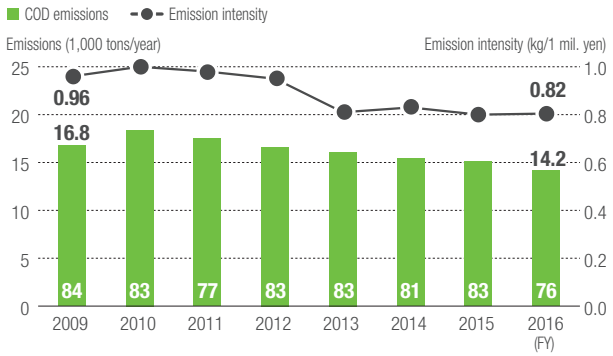
The figures in the bars indicate the numbers of companies that submitted data.
Emission intensity: Emissions per ¥1 million sales

Dust Emissions



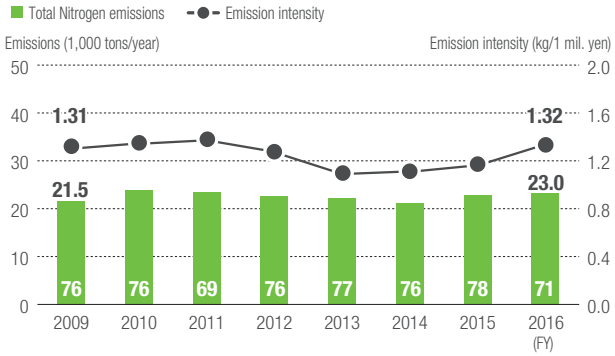
The figures in the bars indicate the numbers of companies that submitted data.
Emission intensity: Emissions per ¥1 million sales

COD Emissions



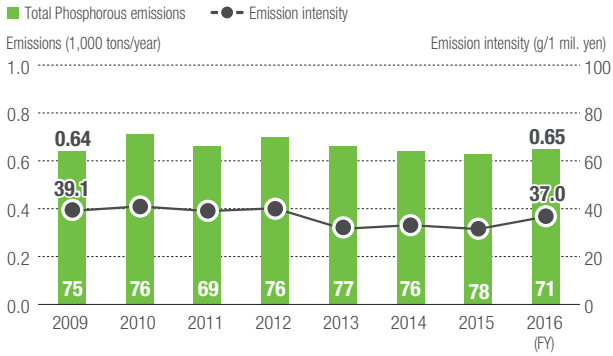
The figures in the bars indicate the numbers of companies that submitted data.
Emission intensity: Emissions per ¥1 million sales

Total Nitrogen Emissions



The figures in the bars indicate the numbers of companies that submitted data.
Emission intensity: Emissions per ¥1 million sales

Total Phosphorous Emissions



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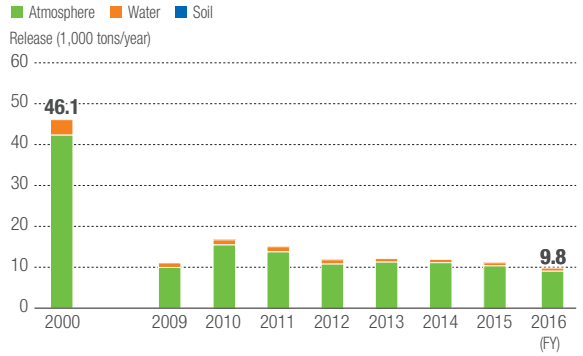
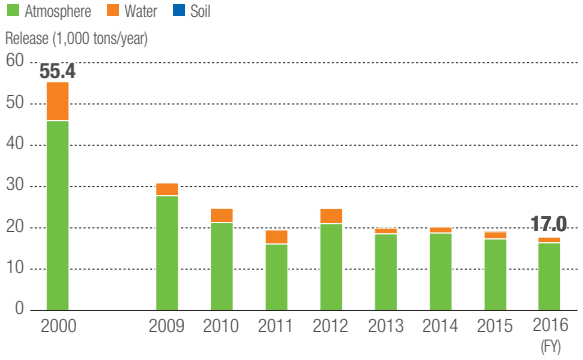
Emission intensity: Emissions per ¥1 million sales

1-4 Environmental Protection (Reduction of Chemical Emissions)

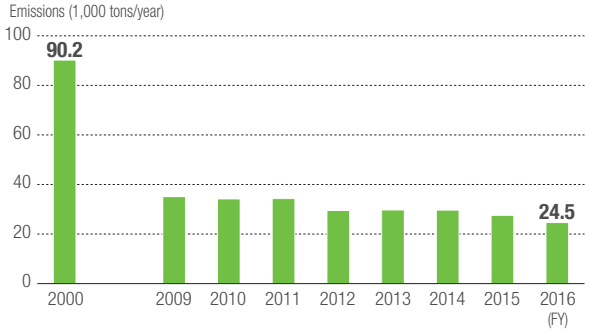
Emissions of PRTR Substances



Emissions of Voluntary Surveyed Substances



VOC Emissions



Emissions of PRTR* Substances

In FY 2016 Emissions of PRTR substances amounted to 9,800 tons, a reduction of about 79% from the FY 2000 level. Because the number of designated substances increased following a revision of the law, the volume of emissions temporarily increased in FY 2010, but since then the downward trend has continued. Emissions into the atmosphere accounted for 92% of the total, and emissions into water areas for 8%. No emissions to soil were reported.

* PRTR (Pollutant Release and Transfer Register): The PRTR system is designed to identify, collect and disseminate data on the amounts and sources of a variety of toxic chemicals released to the environment or transferred outside of facilities in the form of waste. PRTR Law: Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof

Emissions of Voluntary Surveyed Substances

The emissions of voluntary surveyed substances was 17,000 tons, resulting in over 69% reduction compared to FY 2000. The breakdown of the emission quantities was 92% for emissions into the air and 8% for emissions into water areas. No emissions to soil were reported.

Note) Change in the number of substances voluntarily surveyed by JCIA:
From FY 2000 to 2009: 126 substances
From FY 2010 to 2012: 106 substances
From FY 2013 to the current: 90 substances

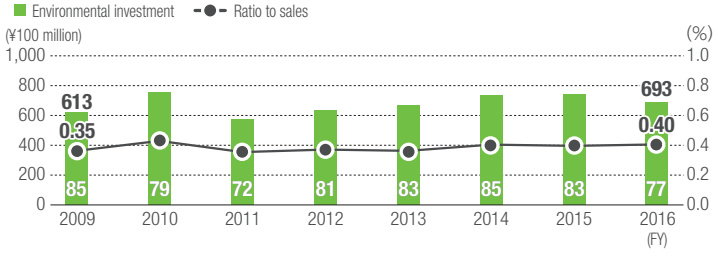
VOC* Emissions

Member companies are making tremendous efforts to install equipment and improve processes for controlling emissions of VOCs.
The VOC emissions in FY 2016 amounted to 24,500 tons, a 73% reduction compared with FY 2000 level, continuing a significant downward trend.

* VOC (volatile organic compound): VOC is a collective term for a wide variety of volatile organic compounds that turn into gas and enter the atmosphere, including toluene, xylenes and ethyl acetate.

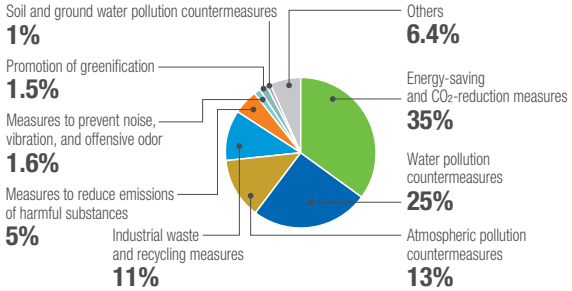
1-5 Environmental Protection (Environmental Investment)

Investment in Environmental Measures



The figures at the bottom of the bars indicate the number of companies that submitted data.

Breakdown of Environmental Investment in FY 2016

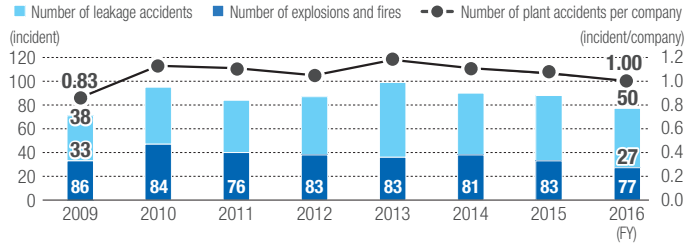


Investment in Environmental Measures

In FY 2016, investment for the installation and maintenance of environment-friendly equipment, such as energy-saving and CO_2-reduction equipment, and for the development of environment-friendly products and technologies remained at roughly the same level as in recent years, amounting to ¥69.3 billion, or the equivalent of 0.40% of sales, with some yearly fluctuation in the amount of investment depending on the number of companies submitting the data. Member companies are implementing the planned investment in environmental measures and steadily linking that investment to sustained improvements in their environmental performance.

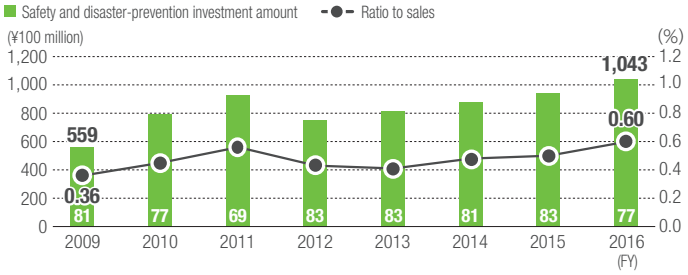
2 Process Safety and Disaster Prevention (Efforts to Prevent Plant Accidents)

Accident Occurrences (Explosions, fires, leakage, etc.)



Note: The number of plant accidents is divided into leakage accidents and explosion/fire accidents.
The figures in the bars indicate the number of companies that submitted data.

Investment in Safety, Security, and Disaster-Prevention Measures



The figures at the bottom of the bars indicate the number of companies that submitted data.

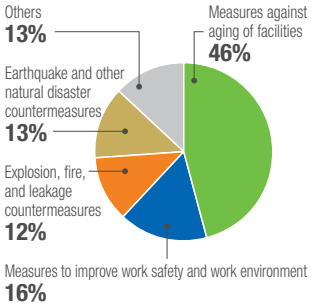
Accident Occurrences

The total number of accidents at plants in FY 2016 was 77, which was lower than in FY 2015, and the number of accident at plants per company (1.00) decreased from FY 2015.

Investment in Safety, Security, and Disaster-Prevention Measures

The investment in safety and disaster prevention in FY 2016 was 104.3 billion yen (up 10% from FY 2015) and the investment-to-sales ratio was 0.60% (up 20% from FY 2015). Member companies are implementing safety and disaster-prevention investment in a planned and sustained manner.

Breakdown of Safety and Disaster-Prevention Investment Amount



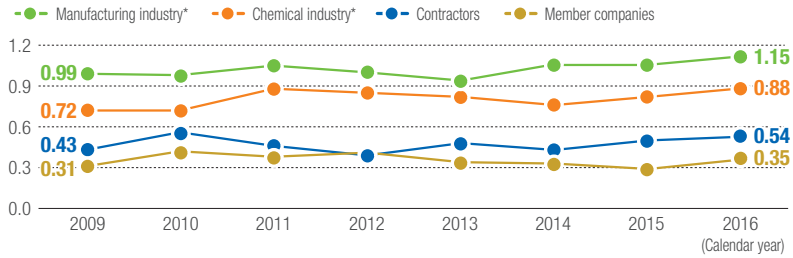
Breakdown of Safety and Disaster-Prevention Investment Amount

Of the investment in safety and disaster prevention in FY 2016, the investment in measures for the aging of facilities accounts for nearly 50% of the total.

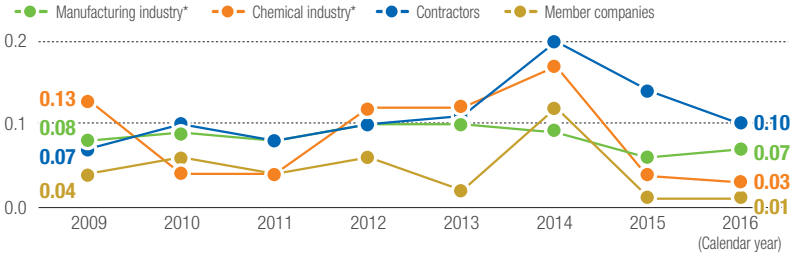
3 Industrial Health and Safety

Occurrence of Occupational Accidents

LTIR Trends



Overall Severity Rates



Number of Fatalities from Occupational Accidents

(Calendar year)

	2009	2010	2011	2012	2013	2014	2015	2016
Member companies	1	2	1	2	0	5	0	0
Contractors	1	1	1	2	2	4	1	1
Chemical industry*	19	11	13	17	17	11	22	12
Manufacturing industry*	186	211	182	199	201	180	160	177

* Data publicly announced by Ministry of Health, Labour and Welfare (MHLW)

LTIR* (Lost Time Injury Rate) Trends

In 2016 LTIR for member companies and their contractors was lower than in the manufacturing industry as a whole and in the chemical industry as a whole, although the figure is hovering around the same level.

$$\text{LTIR} = \frac{\text{Number of lost time injuries}}{\text{Total working hours (per one million hours)}}$$

* LTIR: Indicator that shows the frequency of lost time injuries

Lost Time Injury Severity Rate* Trends

The severity rate of the member companies and their contractors in 2016 improved compared to 2015. However, further efforts for improvement by contractors continue to be needed.

$$\text{Lost Time Injury Severity Rate} = \frac{\text{Number of work days lost}}{\text{Total work hours (per thousand hours)}}$$

* Lost Time Injury Severity Rate: Indicator that shows the severity of occupational accidents

Number of Fatalities from Occupational Accidents

The number of fatalities recorded at member companies and their contractors in 2016 was the same as 2015.

4 Social (Regional) Dialogue

Implementation of Regional Dialogue Meetings

Areas where implemented in FY 2016	Eastern Yamaguchi, Okayama, Hyogo, Osaka, Yokkaichi, Aichi, Chiba, Kashima
Areas where implemented in FY 2015	Oita, Western Yamaguchi, Iwakuni & Otake, Sakai & Senboku, Toyama & Takaoka, Niigata-Kita, Kawasaki

Implementation of Regional Dialogue Meetings

The Responsible Care Committee convenes meetings and maintains a dialog with the local communities once every two years in each area where there is a concentration of member company sites, especially chemical complexes.

5 Members' Self-Assessment

Details of Self-Assessment Scores (Average scores for all member companies based on a five-level assessment system)

Code	MS	EP	PS	OSH	DS	CPS	SD
Assessed item	Important items						
Policy	4.7	4.7	4.6	4.7	4.3	4.5	4.5
Identification of striking environmental aspects, identification of dangerous and harmful factors, etc.	4.5	4.6	4.6	4.6	4.0	4.5	—
Legal and other requirements	4.7	—	—	—	—	—	—
Objectives	4.7	4.5	4.3	4.4	3.9	4.1	3.6
Plans	4.6	4.2	4.4	4.5	3.9	4.2	3.8
Organization	4.4	—	—	—	—	—	—
Education and training	4.2	4.2	4.4	4.5	4.2	4.2	3.6
Communication	4.3	4.0	3.8	4.7	4.3	4.3	4.1
Documentation and document management	4.3	—	—	—	—	—	—
Operation management	4.3	4.2	—	—	4.1	4.7	—
Response to emergency situations	4.5	—	4.2	—	3.7	—	—
Inspection and monitoring	4.5	4.5	4.4	4.4	3.8	4.4	3.8
Corrections and preventive measures	4.5	4.5	4.5	4.6	4.1	4.5	—
Collection of information and management of records	4.4	—	—	—	—	—	—
Auditing	4.6	—	—	—	—	—	—
Revisions by management	4.7	—	—	—	—	—	—
(Overall assessment)	4.5	4.4	4.4	4.6	4.1	4.3	3.9

Abbreviation	Code
MS	Management system
EP	Environmental protection
PS	Process safety and disaster prevention
OSH	Occupational health and safety
DS	Distribution safety
CPS	Chemicals and product safety
SD	Social dialogue

Self-assessment score	Classification
4.5 points or over	Very satisfactory
3.5 to under 4.5 points	Just about satisfactory
2.5 to under 3.5 points	Somewhat unsatisfactory
Under 2.5 points	Unsatisfactory

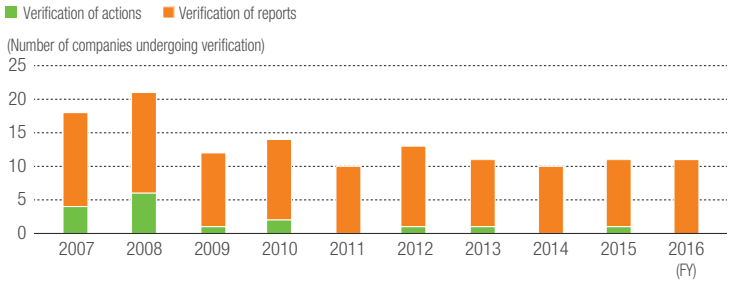
Details of Self-Assessment Scores (Average scores for all member companies)

On a scale of 5, scores in the 4-point range were recorded for all of the important items in the categories of management system, environmental safety, occupational health and safety, and the chemicals and product safety showing that the PDCA cycle is rotating at a high level in these categories.
In the category of process safety, enhanced communication is desirable.
In the category of distribution safety, the main issues are the response to emergency situations, and inspection and monitoring.
In the category of social dialogue, there are still many issues, such as objectives, plans, education and training, and inspection and monitoring.

If compared to the last fiscal year, significant improvement has been seen on the environmental safety, the operation management on the chemicals and product safety, and the education and training of distribution safety.

6 Responsible Care Verification

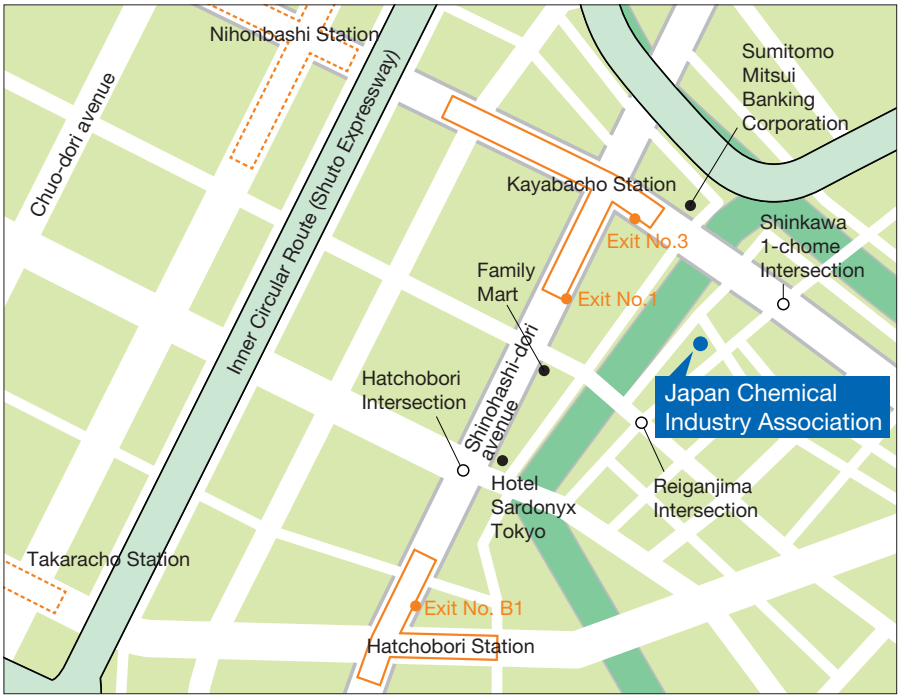
Companies Undergoing a Responsible Care Verification



Companies Undergoing a Responsible Care (RC) Verification

In FY 2016, 11 companies underwent a responsible care verification (11 for verification of reports and 0 for verification of actions). The total number of companies that have undergone an RC verification is 196 (151 for verification of reports and 45 for verification of actions).
Verification of reports (11 companies): Sanyo Chemical Industries, Ltd., Daicel Corporation, Nippon Shokubai Co., Ltd., Asahi Kasei Corporation, Kaneka Corporation, Ube Industries, Ltd., JSR Corporation, Shin-Etsu Chemical Co., Ltd., Sumitomo Seika Chemicals Company Limited, Nippon Soda Co., Ltd., and TOKYO OHKA KOGYO CO., LTD.

Please refer to the publications posted on the JCIA website regarding other information such as the aggregate results on the questionnaire for member companies.



Access Information

Kayabacho Station.
(Tokyo Metro Hibiya and Tozai Lines)
Approximately 3 minutes on foot
from Exit No.1 or Exit No.3

Hatchobori Station. (JR Keiyo Line)
Approximately 8 minutes on foot
from Exit No.B1

Contact

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Labor Department
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Technical Affairs Department
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Chemicals Management Department
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Responsible Care Department
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Dream Chemistry 21 Committee
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Nikka-chan:
JCIA's official character

October 23 is
Chemistry Day

Japan Chemical Industry Association

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